

The political feasibility of potent enforcement in a post-Kyoto climate agreement

Abstract To be effective, a post-Kyoto climate agreement must secure significant greenhouse gas emissions reductions by all (key) emitters. Potent participation and compliance enforcement will be required to make it in every key emitter's best interest to participate in, and comply with, an agreement which specifies deep emissions reductions for all its signatories. This article considers the conditions under which potent enforcement would likely be politically feasible. Based on assessments of the current political landscape, and on the sets of constraints that characterize negotiations over enforcement systems, the article firstly finds that *neither* type of enforcement would be politically feasible if agreement is sought among all key emitters. Secondly, because participation enforcement is perceived as less legitimate than compliance enforcement, the coalition of countries prepared to accept the former is likely smaller than the coalition prepared to accept the latter. Thirdly, participation enforcement likely places stricter requirements on the coalition's membership and size. Thus, while compliance enforcement should in principle *always* be politically feasible among *some* coalition, reaching agreement on participation enforcement is less likely. To the extent that participation enforcement *is* politically feasible, however, an agreement which enforces the cooperation of all key emitters may be attainable.

Keywords Participation, Compliance, Enforcement, Climate agreements, Political feasibility.

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1 Introduction

Climate change mitigation is a global public good. The collectively optimum amount of mitigation requires that all (key) emitters reduce their greenhouse gas (GHG) emissions significantly. The Kyoto Protocol's first commitment period, which ran from 2008 to 2012, was characterized by limited participation,¹ and despite its modest ambitions, some signatories may have participated without complying (fully) with their commitments.² Participation in the second commitment period, running from 2013 to 2020, will be even more limited; Canada has withdrawn from Kyoto altogether, and Japan and Russia have announced their unwillingness to extend the Protocol beyond 2012 unless *all* key emitters accept emissions reduction obligations. In so doing, they have joined ranks with the US, which refuses to accept reduction targets unless emerging economies such as China and India commit to reducing their emissions too. China and India, on the other hand, refuse to commit to reducing their emissions unless developed countries reduce their emissions first. Thus, it appears that the world's largest emitters are in what Victor (2011) aptly describes as a "global warming gridlock" as far as prospects for an effective climate agreement post-Kyoto are concerned.

Enforcement offers a promising means to escape the current diplomatic gridlock; with potent systems for participation and compliance enforcement, a broad and deep climate agreement with high compliance rates could be established (Barrett 1997, 1999). Because countries cannot be excluded from enjoying the benefits of emissions mitigation, and because mitigating emissions is costly, sticks or carrots will be required to make it in every country's interest to participate in, and comply with, a deep international climate agreement (Aakre and Hovi 2010; Barrett 2008).

While there is a vast literature analyzing the conditions under which international environmental agreements (IEAs) can effectively be enforced, there has been very little focus on the

1. Although there were 192 signatories, only 37 (the so-called Annex I countries) participated with emissions mitigation targets. Annex I countries are responsible for approximately 25 percent of global emissions.

² The Kyoto Protocol's first commitment period was followed by a 100 day grace period during which parties were allowed to ensure compliance. Compliance data have thus far not been published.

political *feasibility* of effective enforcement systems. The lack of research on the conditions under which effective policies are also likely politically feasible is surprising, given the discrepancy which is often found in environmental policy-making between what constitutes the most effective policy option on the one hand, and what is politically feasible on the other (Skodvin 2007). Concerning enforcement, while theoretically there are good reasons to incorporate potent participation and compliance enforcement in IEAs that provide public goods, most IEAs lack such provisions. By improving our knowledge of the factors that influence whether a given policy proposal can successfully be adopted, it might be possible to devise strategies for overcoming the constraints that are at play and to lessen the gap between the “desirable and the possible” (Meltzer 1972).

This article is the first to provide a systematic assessment of the political feasibility of potent enforcement systems in a post-Kyoto agreement. When an IEA’s architectural features are subject to negotiations between sovereign countries, the political feasibility of a given proposal depends on agreement between the negotiating parties. Whether a policy proposal is acceptable to the negotiating parties, in turn, depends on how the proposal corresponds with their interests and values. Is potent enforcement in a post-Kyoto climate agreement likely to correspond with (key) parties’ interests and values? If so, under what conditions? Are there differences between participation and compliance enforcement, and how might such differences influence their relative likelihood of being adopted? Finally, since an effective climate agreement requires both types of enforcement, what are the conditions (if any) under which a climate agreement containing both types of enforcement is likely politically feasible?

IEAs often exhibit a gradual deepening of cooperation (Mitchell 2003). The theoretical literature on the enforcement of IEAs tends to ignore gradualist approaches to cooperation, and consequently fail to adequately explain how first best outcomes are attained (Urpelainen 2011). Studies of gradualism, on the other hand, generally regard enforcement as unimportant to international environmental cooperation (Urpelainen 2011). The findings in this article suggest that neither type of enforcement is likely politically feasible if negotiations include all key emitters. Nevertheless, there are conditions under which a broad and deep agreement with both types of enforcement *may* be

politically feasible. Specifically, an agreement with potent enforcement is more likely politically feasible with a gradualist approach to establishing cooperation.

Firstly, although potent participation enforcement is likely subject to more demanding political constraints than compliance enforcement, the latter requires consensus among the negotiating parties, while the former can be incorporated without requiring consent by all countries to which the measures are intended to apply. Secondly, and related to this, the feasibility of compliance enforcement is likely influenced by whether participation enforcement is present; once reluctant countries have been admitted, consent by all parties on the incorporation of compliance enforcement is unlikely. Therefore, a broad and deep climate agreement with both types of enforcement is more likely politically feasible if negotiated among an initial coalition of the willing, and if the participation of reluctant countries is only elicited *after* such systems have been adopted.

The remainder of the article is organized as follows. The next section presents an analytical framework to explore the feasibility of each policy option. Next, a discussion of what characterizes potent enforcement systems in IEAs is provided, followed by an example of what such an enforcement system might look like in a climate agreement. The analytical framework is then employed to assess the political feasibility of potent participation and compliance enforcement. The penultimate section provides a discussion of similarities, differences and likely policy pathways, while the final section offers the main conclusions.

2 Political feasibility in international negotiations: Interests, ideas and institutions

An assessment of the political feasibility of a given architectural feature in international negotiations requires identifying 1) the policy options and the criteria against which these are evaluated; and 2) the negotiation system, consisting of the institutional setting within which decisions are made, and the set of negotiating parties, their preferences and power (Underdal 1997).

In climate negotiations, national economic welfare, the interests of important domestic groups and correspondence with salient norms feature prominently among the criteria against which policy options are evaluated (Underdal 1997). For instance, concerning participation in the Kyoto Protocol,

free-rider incentives are negatively correlated with expected damage costs from climate change, and positively correlated with compliance costs (Bosetti et al. 2009). Even if a policy option is beneficial from a national welfare point of view, however, domestic political constraints (eg, dissatisfied target groups) and normative constraints might serve to modify countries' preferences over the different policy options. For instance, the US position in the climate negotiations has been heavily shaped by the interests of the fossil fuel lobby and concerns about the competitiveness of domestic industries (Ward et al. 2001). Among normative constraints, equity considerations (eg, the historical responsibility for the accumulation of GHGs) have been particularly important, and one main reason why developing countries are exempted from emissions reduction targets.

Concerning next the negotiation system, climate change mitigation is a global public good, where all countries have a stake in the outcome and an interest in what deal is struck. Hence, all countries are potential parties to the negotiations. The decision-making rules used to aggregate the parties' preferences specify the conditions under which decisions are adopted. In IEAs, decisions typically rely on consensus, although, in practice, only pivotal countries are in a position to block a decision (Underdal 1998). Thus, a policy option is politically feasible if no pivotal country opposes the proposal. In climate negotiations, the extent to which a party is considered pivotal is to a large extent determined by its share of global GHG emissions.

3 What characterizes potent enforcement?

The focus of this article is on deep climate agreements, where the agreement's depth can be defined as "the extent to which it requires states to depart from what they would have done in its absence." (Downs et al. 1996) The bottom-up pledges made pursuant to the Copenhagen Accord might serve as an indicator of the extent to which countries are currently prepared to mitigate emissions. These mitigation efforts, however, would not be sufficient to ensure that the United Nations Framework Convention on Climate Change (UNFCCC) objective of limiting climate change to 2° C is met (UNEP 2010). The significant departures from business as usual that would be required in a deep climate agreement will entail non-trivial costs for most countries. Moreover, since climate change

mitigation is a global public good, the costs to each country of mitigating its emissions exceed the benefits to that country of reduced climate change. Absent participation enforcement, the utility-maximizing option for countries is to not participate. Similarly, absent compliance enforcement, the utility-maximizing option for participating countries is to not comply.

In an anarchical system, the formation of IEAs relies on the voluntary participation of sovereign countries. Absent participation enforcement, countries should only agree to become signatories if they expect that they will be able to comply with their commitments (Downs et al. 1996; von Stein 2005). If complying is prohibitively costly, and if the IEA does not enforce participation, it seems reasonable to expect that countries would decline to ratify the IEA.

The types of measures that could be used to enforce an IEA include punishments (eg, trade restrictions) and/or rewards (eg, side payments). Concerning participation enforcement, a distinction can be made between using punishments and/or rewards to *induce* countries to become signatories to an IEA, and using punishments and/or rewards to *deter* signatories from withdrawing.

Potent enforcement may be defined as a strategy for punishment or reward that is credible and provides sufficiently strong incentives to outweigh the benefits of not participating (complying). Not only must it be in the interest of signatories to punish non-participating (non-compliant) countries and/or to reward participating (compliant) countries, but such punishments and/or rewards must also be sufficiently large to offset the benefits a country could obtain by not participating (complying). When these conditions are met, the utility-maximizing course of action is to participate in, and comply with, the IEA.

4 Using trade restrictions to enforce climate cooperation

Previous research suggests that issue-specific reciprocity (ie, retaliation in kind) is often of limited effectiveness in enforcing cooperation characterized by strong free-rider incentives (Barrett 1999). This has spurred an extensive debate on the potential for increasing the amount of cooperation that can be sustained by linking cooperation on climate change mitigation to cooperation on other issues. Among the proposals most frequently discussed by academics and policy makers alike is to incorporate some variant of trade restrictions. Therefore, the discussion of the political feasibility of

enforcement in the next sections will mainly revolve around enforcement by means of trade restrictions.

The academic debate on using trade restrictions has mainly focused on whether they are compatible with World Trade Organization obligations (Veel 2009; Zhang 2009), their effects on trade and climate policy (Houser et al. 2008; Weber and Peters 2009), their technical and administrative feasibility (Messerlin 2010), and on the conditions for effective enforcement (Barrett 1999; Lessmann et al. 2009).

Among policy makers, the possibility of introducing trade restrictions has typically been discussed as a means of preventing carbon and trade leakage. Trade restrictions may consist of subjecting imports to levies based on the amount of carbon embedded in the good, either as a border tax adjustment or as a requirement that emissions permits be surrendered, depending on whether domestic climate legislation specifies a carbon tax system or an emissions trading system (Houser et al. 2008). Trade measures were part of the debate in European Parliament during discussions over the 2008 climate and energy package, and their use is included as a possibility in the revised EU Emissions Trading Scheme Directive. In the US, legislative proposals such as the Lieberman-Warner bill, the Waxman-Markey bill and the Kerry-Lieberman bill have included plans to require that importers of products covered by the emission trading scheme buy emission permits.

5 The political feasibility of potent enforcement

Is a climate agreement enforced by means of trade restrictions likely politically feasible? This section considers each of the three categories of political constraints in turn; 1) how is potent enforcement likely to be evaluated by the negotiating parties?; 2) how are decisions on enforcement systems reached?; and 3) who are the pivotal countries or coalitions of countries?

5.1 How is potent enforcement likely to be evaluated by the negotiating parties?

To get an impression of how potent sticks affect national welfare, first, a distinction can be made between countries that expect to comply, and countries that do not expect (or are uncertain about

their ability) to comply, with the agreement (Hovi and Holtmark 2006). There could be several reasons why countries might not expect to comply (fully). Firstly, emissions mitigation might correspond poorly with salient norms such as fairness. For instance, in UNFCCC negotiations, agreement on which countries should have emissions reductions commitments has been based on equity considerations and the principle of Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC). Secondly, countries differ quite significantly in terms of mitigation costs, as well as the environmental benefits of undertaking emissions mitigation. Thirdly, countries might have a weak capacity (administrative or technological) to comply.

To countries that expect to find compliance difficult, the incorporation of potent sticks to enforce participation (compliance) will have a *negative* effect on national welfare. Absent enforcement, the utility-maximizing course of action is to not participate (comply). In an agreement with participation enforcement, a country that faces difficulties complying with its commitments will suffer punitive consequences from withdrawing from the agreement (or not becoming a signatory in the first place). Similarly, if compliance is enforced, non-compliant countries suffer punitive consequences. Anecdotal evidence suggests that the countries most skeptical of incorporating a compliance enforcement system in the Kyoto Protocol were countries that were not prepared to comply, or were uncertain about their own prospects for compliance (Werksman 2005).

To countries that expect to comply, the incorporation of potent sticks to enforce participation (compliance) could have a *positive* effect on national welfare. The incorporation of enforcement should have no effect on *their* decision to participate and comply (Aakre and Hovi 2010). However, because the incorporation of enforcement creates incentives for *others* to participate (comply), it could be in such countries' interest to incorporate enforcement, provided that the costs are not too high. During the negotiations over the Kyoto Protocol's compliance system, the pro-enforcement positions of countries such as the US, Canada and the EU "seemed to be predicated on the assumption that it would be a country other than its own that would find itself facing the Enforcement Branch." (Werksman 2005) As commitments deepen, ensuring that other countries also honor their commitments will likely be even more important, as the costs of receiving the "sucker's payoff" will be even higher.

The positions of important domestic interest groups and how a policy option corresponds with salient norms might modify or reinforce countries' negotiating positions. Regarding domestic interests, competitiveness concerns were a main reason why the parties to the Kyoto Protocol were able to reach agreement on a compliance enforcement system (Werksman 2005). The costs of mitigating emissions will usually be concentrated to a few domestic industries (eg, emissions intensive industries), placing these industries at a competitive disadvantage vis-à-vis industries in countries with less stringent climate policies. Potent enforcement serves to level the playing field. To the extent that sectors exposed to costly climate policies constitute a significant portion of a country's economy, their interests will likely be taken into account when assessing the desirability of enforcement, especially since many of these industries can otherwise threaten to relocate to unregulated markets (Skodvin et al. 2010). Thus, even if potent enforcement might entail significant costs to compliant countries' overall economic welfare, it may nevertheless be strongly desired by important domestic interest groups, and hence be a politically feasible option.

More broadly, climate policy requires public support in order to be politically feasible in the long term (Bechtel and Scheve 2013; Bernauer et al. 2013). Tingley and Tomz (2013) find that, while there is generally little support for enforcement via issue-specific reciprocity, significant public support exists for enforcement if it consists of linking cooperation on climate change to cooperation on other issues, such as trade. Bechtel and Scheve (2013) find that public support for international climate cooperation depends on the specific architectural features of the climate agreement. For instance, support is more likely if the agreement is perceived to be effective and to correspond with fairness norms. Also, public support is higher if the agreement is monitored by an independent third party, and if it incorporates punishment for non-compliant parties.

Concerning correspondence with salient norms, of particular relevance to the question of enforcement is the principle of state consent, a principle which ensures that countries retain their sovereignty. Enforcement is a matter of devising strategies to influence the behavior of legally sovereign countries, and agreeing to be bound by enforcement systems arguably entails a certain loss of autonomy. The extent to which the principle of state consent influences countries' negotiating positions would likely depend on the type of enforcement measure considered, however. For instance,

using rewards to induce cooperation would likely be perceived as less problematic than would the use of punishments. Also, compliance enforcement would likely be perceived as less of an infringement on sovereignty than would participation enforcement; while compliance enforcement applies only to countries that voluntarily choose to participate in an agreement, participation enforcement seeks to influence countries' choices of whether to participate. Sovereignty issues are perhaps particularly apparent when punishments are directed at non-signatory countries (ie, when climate policies are extended unilaterally to countries that have not consented to the agreement).

5.2 Process through which preferences are aggregated

With negotiations at the international level usually relying on consensus decision-making, cooperation “will be limited to those measures acceptable to the least enthusiastic party” (Underdal 1980). Concerning negotiations over potent enforcement, enthusiastic parties would be countries that desire enforcement (eg, countries that expect to comply), while the least enthusiastic party would be any country that opposes enforcement (eg, countries that do not expect to comply). If no country expects to find difficulties complying with an agreement which specifies deep emissions reductions for all its signatories, potent enforcement should be politically feasible. If countries exist that do not expect to comply (fully) however, there are a few possible negotiation outcomes (Hovi and Holtmark 2006).

Firstly, mitigation targets could be adjusted so that no country expects to find compliance difficult.³ That is, the parties could negotiate a shallow agreement, where signatories are not required to depart much from what they would have done absent the agreement. Secondly, instead of a “broad but shallow” agreement, agreement can be sought among the group of countries that expect to comply only. That is, the parties could negotiate a “narrow but deep” agreement.

3. Alternatively, as was done in Kyoto, exemptions can be made so that the enforcement system applies only to certain countries.

In all scenarios, whether enforcement is in fact politically feasible, depends on the positions of pivotal parties. In addition to its share of global emissions, a country's economic size will likely be important in determining whether it is considered a pivotal party in negotiations over enforcement; enforcement must provide sufficiently strong incentives to induce participation (compliance), and for many of the measures available, incentives are closely related to the parties' market sizes.

5.3 Key emitters and their likely positions

A relatively small number of countries account for a large share of global CO₂ emissions, and these are also the countries with the largest economies. In 2008, China ranked the highest, accounting for close to 24 per cent of global emissions. China is part of the BASIC bloc (together with Brazil, South Africa and India) in UNFCCC negotiations, and this bloc accounted for approximately 32 per cent of global emissions in 2008. The US accounted for approximately 18 per cent of global emissions in 2008. The US is part of the Umbrella group, which also consists of Russia, Japan, Canada, and Australia.⁴ Together, these five countries accounted for approximately 31 per cent of global emissions in 2008. Finally, the EU-27 emitted close to 14 per cent of the world total in 2008.

The BASIC bloc has resisted any quantified commitments to reduce emissions; since the group is not responsible for the buildup of GHGs, and since their capabilities to undertake emissions reductions are limited, future mitigation obligations must be based on the principle of CBDR, which entails that developed countries must take the lead in reducing emissions. Unsurprisingly, these countries are also united in their resistance to the incorporation of enforcement. BASIC countries were against compliance enforcement in Kyoto, and only changed their stance once it became clear that the system would not apply to them (Werksman 2005). This position is likely also in future negotiations, as illustrated by the Indian Ministry of Environment's statement; "Developing countries need not have a compliance regime even though the new treaty or Arrangement could apply to all Parties. This is

4. The Umbrella group is usually also made up of other non-EU developed countries. However, these are small economies and/or small emitters.

because the targets of developing countries will need to continue to be voluntary” (MOEF 2012). The BASIC bloc has also staunchly opposed the idea of participation enforcement, and China has even threatened retaliation if border carbon adjustments are imposed (Dalton 2012). BASIC group members have on several occasions requested that the issue of trade restrictions be included as an agenda item during UNFCCC negotiations. Arguments have revolved around how participation enforcement would unduly restrict national sovereignty, as well as its negative impact on national economic welfare and domestic interests (UNFCCC 2011a, 2011b, 2012a)

Concern about the negative effect on national welfare and domestic industries’ competitiveness that would result if large emitters such as China and India were exempted from mitigation obligations was the key motivation behind the US’ decision to not ratify Kyoto. Concerns about free-riding have moreover entailed a positive stance regarding enforcement, and the US would likely vote in favor of both types of enforcement post-Kyoto. Indeed, the US would likely make the incorporation of enforcement a precondition for participating. Once the US ratifies an international agreement, it becomes part of domestic law, and hence legally binding. While compliance enforcement would thus not have any effect on its own compliance decision, it could nevertheless serve to secure others’ compliance. Concerning participation enforcement, important domestic interest groups, such as the steel industry, have made the incorporation of measures to protect their competitiveness a prerequisite for accepting national mitigation targets (van Asselt and Brewer 2010). The US has also opposed developing countries’ repeated requests during negotiations over a post-Kyoto climate agreement that developed countries refrain from resorting to trade restrictions.

The remaining Umbrella group members’ positions would likely align with those of the US. National economic interests and the protection of domestic competitiveness were motivations for the group’s pro- enforcement position in Kyoto (Werksman 2005). Several members have formally highlighted the importance of transparency and provisions for monitoring, reporting and verification in a post-Kyoto agreement (UNFCCC 2011c, 2012b, 2012c). Participation enforcement has thus far not been formally contemplated in most Umbrella group countries. However, national economic welfare considerations and the issue of carbon and trade leakage have featured as key explanations for their recent decisions to make further mitigation commitments contingent on meaningful participation by all

major emitters (Kent 2011). The group has moreover supported the US in opposing developing countries' request that developed countries refrain from resorting to trade restrictions. Together, this can be taken as an indication that the Umbrella group members are at least not entirely opposed to the idea of incorporating participation enforcement. Australia constitutes one possible exception, however. Domestically, Australia has thus far refrained from restricting trade with countries without comparable mitigation policies, choosing instead to address competitiveness concerns by distributing free permits to trade-exposed domestic industries. The skepticism toward trade restrictions has mainly been based on normative considerations (Comley 2011). Thus, even though participation enforcement would positively affect national and domestic interests, its poor correspondence with salient norms could potentially tip their position in favor of an agreement without such measures.

The EU would likely be in favor of incorporating compliance enforcement in a post-Kyoto agreement. In a recent UNFCCC submission, the EU stressed the importance of compliance enforcement, noting that post-Kyoto cooperation “must be transparent and reliable to allow for comparability of effort and to ensure that we are on track to meet our common 2°C objective.” (UNFCCC 2012c) As discussed in section 4, the use of trade measures has been formally contemplated. Thus far, however, the EU has opted to approach the threat of carbon and trade leakage by distributing free permits to exposed domestic industries. For a brief period, aviation constituted an exception; as of 2012, all flights arriving at or departing from an EU airport were required to surrender permits. However, following massive international opposition, the requirement was temporarily suspended in 2013.

Even if the requirement had not been suspended, it is currently not evident that the EU would be prepared to extend the use of trade measures to other sectors: regarding aviation, part of the activity which causes emissions occurs over EU territory, and in this respect, requiring airlines to surrender permits may be perceived as less of an infringement on sovereignty than attempting to regulate emissions which occur exclusively within another country's territory. Normative considerations have entailed significant resistance to the possible introduction of a general restriction on trade with countries without comparable mitigation policies. In 2009, the German State Secretary for the

Environment expressed fears that trade restrictions could be perceived as a form of “eco-imperialism” (Shanley and Wissenbach 2009). Britain, too, has resisted the idea of incorporating trade measures in EU climate policy (EurActiv 2008). At the same time, however, agreeing on measures to induce the participation of large emitters will likely be key to engaging the US in a post-Kyoto agreement. It is therefore difficult to predict which considerations will eventually weigh more heavily in shaping the EU’s position.

The key emitters’ likely positions regarding the incorporation of enforcement systems are summarized in Table 1 below.

Table 1 Key Emitters and their likely Positions Regarding the Incorporation of Potent Enforcement

Party	Participation Enforcement?	Compliance Enforcement?
BASIC bloc	No	No
Umbrella group <i>US, Canada, Japan, and Russia</i>	Yes	Yes
<i>Australia</i>	No	Yes
EU	Uncertain	Yes

6 Similarities, differences, and likely policy pathways

Participation and compliance enforcement are to a large extent comparable in terms of their effects on national and domestic interests; incorporating potent sticks positively affects the interests of countries that expect to comply, while negatively affecting the interests of countries that do not expect to comply (fully). We have noted that the BASIC bloc is currently unprepared to comply with any binding mitigation targets, and consequently has resisted the idea of incorporating potent sticks. There is thus one treaty design where *neither* type of enforcement system would be politically feasible: in a deep climate agreement in which all key emitters participate in negotiating the agreement. The reason is that, for both types of enforcement, the coalition of countries willing to accept enforcement does not include all key emitters.

There are, however, also important differences between the two types of enforcement. Firstly, ensuring that the politically feasible enforcement measures are potent, may be more challenging for participation than for compliance enforcement. Given that a coalition of enthusiastic countries exists, it should in principle always be possible for this coalition to agree on a compliance system which is credible and provides sufficient incentives for compliance. Participation enforcement, on the other hand, is often directed at unenthusiastic countries. Adding to this, the choice of leverage instruments is more limited; measures such as withdrawal of membership privileges, fines, and confiscation of monetary deposits are only available once countries have agreed to become signatories. Together, this entails that the membership and size of the coalition of signatories is likely more important in establishing sufficiently strong incentives for participation. Specifically, the coalition would likely need to include several key emitters. The larger the coalition required, however, the more difficult it is to reach agreement on potent enforcement.

Secondly, although the two types of enforcement are to a large extent comparable in terms of their impacts on national welfare and domestic interests, participation enforcement is perceived as somewhat more problematic from a normative perspective. Thus, although participation enforcement likely requires agreement among a larger coalition of the willing, such agreement may perhaps be *less likely*. One reason for the observed divergence in attitudes toward the two types of enforcement is that participation enforcement challenges the principle of sovereignty to a much greater extent than compliance enforcement. A country is only bound by an agreement's compliance system as long as it chooses to be a signatory. Moreover, should a signatory no longer find it in its best interest to comply, it may opt to withdraw. In other words, being a party to an agreement which only contains compliance enforcement is entirely voluntary. Participation enforcement, on the other hand, seeks to deter signatories from withdrawing, and to induce countries which have not consented to the agreement, to nevertheless become signatories. We have noted that the EU and Australia would likely be in favor of compliance enforcement, but find the idea participation enforcement somewhat more troubling.

That participation enforcement offers a means to establishing cooperation non-consensually also entails that the agreement can have more of an *effect* on the provision of climate change mitigation. The principle of state consent limits the effectiveness in international negotiations to the

least common denominator (Underdal 1980). For compliance enforcement, this entails that only countries that expect to comply should consent to an agreement which enforces compliance. However, compliance enforcement would then have little or no effect on these countries' compliance decisions (Aakre and Hovi 2010). Participation enforcement, on the other hand, can induce the participation of countries that would *not* have consented to an agreement with enforcement, had they participated in negotiating it. That is, participation enforcement may be used to (non-consensually) elicit the participation of countries that do not expect to comply (fully). Indeed, it is primarily engaging unenthusiastic countries around which the discussion on the use of sticks has revolved. In the US, the discussion has typically revolved around engaging countries such as China. In the EU, the discussion initially revolved around engaging the US, once it became clear that the US would not ratify Kyoto. Thus, whereas legitimacy concerns entail that consent on participation enforcement is less likely than consent on compliance enforcement, with participation enforcement consent is not necessarily *required* by all countries to which the measures are intended to apply. Consequently, participation enforcement offers a means to improve on the least common denominator outcomes that result when enthusiastic and unenthusiastic countries alike sit around the negotiating table.

Two decades of formal negotiations under the UNFCCC have failed to produce an effective agreement. The approach to establishing effective cooperation has been to negotiate the terms of an agreement among the UNFCCC's 195 parties, with the intention of establishing more ambitious cooperation over time.⁵ The Kyoto Protocol is shallow, in the sense that participants have committed to little more than business as usual (von Stein 2008). With the current diplomatic gridlock, it is far from clear that the "broad, then deep" approach will succeed in achieving the twin goals of establishing broad *and* deep cooperation.

The existing gap between the most effective outcome and the politically feasible outcome has motivated a recent literature on gradual strategies for overcoming the political constraints that characterize cooperation on climate change mitigation. With a point of departure in the politically

⁵ Several scholars have noted that a trade-off often exists between the depth and breadth of international cooperation (eg, Barrett 2002; Downs et al. 1996) . But see Gilligan (2004), who argues that this trade-off only exists when all parties are required to set their policy at the same level.

feasible, these contributions have in common that they focus on mechanisms that may help narrow the gap between the “desirable and the possible”. Levin et al. (2012) advocate an “applied forward reasoning” approach, arguing that the generation of path-dependent policy-interventions in the present can help ensure desired climate policy goals in the future. Urpelainen (2013b) proposes a “dynamic climate governance” strategy, in which “small wins” policies with technological and political transformation potential help secure effective policies over time. Falkner et al. (2010) suggest a “building blocks” strategy in which new policy elements are added in an incremental fashion. Finally, Victor (2011) recommends abandoning the current “broad, then deep” approach in favor of an approach where enthusiastic countries agree among themselves on the terms of an effective agreement.

The findings in this article support the recommendation that negotiations follow a minilateral approach rather than the UNFCCC’s “broad, then deep” approach; enforcement is more likely politically feasible if countries that do not expect to comply (fully) are left out of negotiations over the agreement’s enforcement systems. Moreover, if a coalition of the willing agrees on potent systems for enforcement, a “deep, then broad” approach to establishing effective cooperation could succeed. Whereas compliance enforcement does not have the potential to induce the participation of unenthusiastic countries, participation enforcement does. Consequently, if a coalition of the willing successfully introduces participation enforcement, compliance enforcement will also be required to ensure the compliance of the countries whose participation has been induced (Aakre and Hovi 2010). To increase the likelihood of achieving agreement on *both* types of enforcement, the findings in this article suggest that agreement on compliance enforcement should be sought prior to the entry-into-force of participation enforcement measures, since compliance enforcement would likely *not* be politically feasible if all key emitters are present at the negotiation table. That is, only after agreement on *both* types of enforcement systems has been reached, should the participation of unenthusiastic countries be induced to move the agreement from narrow to broad in terms of membership.

Having noted that China and India are unlikely to accept enforcement; would a coalition of the willing nevertheless be able to induce these key emitters’ participation in an agreement with enforcement? To induce the participation of key emitters, incentives for participation would need to be rather large, while at the same time not too costly for the coalition of the willing. Studies suggest that

unilateral trade measures would be futile in compelling countries such as China to undertake comparable emissions reductions (Houser et al. 2008). Considering larger coalitions, coalitions comprising the current Annex I countries and the US could succeed in inducing the participation of countries such as India and China (Mattoo et al. 2009; Winchester et al. 2010).

Although these studies find that a sufficiently large coalition of the willing could succeed in inducing the participation of all key emitters, it is far from clear that a sufficiently large coalition would in fact be prepared to incorporate provisions for enforcing the participation of the BASIC bloc and other unenthusiastic countries. Australia would likely vote against participation enforcement, but would not necessarily be a pivotal actor, as it accounts for less than 2 per cent of global emissions. The position of the EU and the US, on the other hand, could matter a lot more. Currently, that the EU would be prepared to enforce the participation of unenthusiastic countries is uncertain at best; even if participation enforcement positively affects national welfare and domestic interests, some member states question the legitimacy of participation enforcement. Thus far, however, the discussion has mainly revolved around the use of sticks. By considering the use of carrots (alone or in combination with sticks), participation enforcement might no longer necessarily be perceived as a form of “eco-imperialism”. Technology-oriented agreements, for instance, could help create (positive) incentives to participate in a climate agreement (de Coninck et al. 2008; Urpelainen 2012, 2013a).

Finally, even if the US would likely vote in favor of both types of enforcement, it is less certain whether the US would be prepared to enter negotiations in the first place unless China too is present. Without the US, a deep and broad post-Kyoto climate agreement with high compliance rates is unlikely to materialize.

7 Conclusion

To reach the first best outcome of a broad and deep climate agreement with high compliance rates, potent participation and compliance enforcement is required. Given the strong norm of consensus in international decision-making, enforcement would likely not be politically feasible if negotiations include all key emitters. Based on assessments of the current political landscape, and on the political constraints that characterize the climate negotiations, this article has suggested an alternative approach to negotiating a deep and broad post-Kyoto climate agreement which may increase the likelihood of potent enforcement being adopted. In particular, agreement on potent enforcement is more likely if negotiated among a coalition of the willing, and if countries that do not expect to comply (fully), are not present at the negotiating table.

Although the article has pointed out some ways which may make enforcement *more* likely feasible, providing accurate point predictions as to *whether* potent enforcement in fact *is* politically feasible is a much more demanding task. Compliance enforcement should in principle always be politically feasible among *some* subset of countries, notably if the coalition comprises parties that expect to comply with their emissions mitigation obligations. In the current political landscape, such agreement seems attainable among the EU and the members of the Umbrella group. Participation enforcement *may* be politically feasible among a coalition of the willing. Again, such agreement is more likely if the negotiating parties comprise countries that expect to comply. Whether participation enforcement in fact *is* politically feasible, however, depends on whether this coalition of countries succeeds in agreeing on measures that are credible and provide sufficient incentives for participation. To a large extent, this would seem to depend on the coalition's size and membership; a small coalition (or unilateral efforts) would likely be unsuccessful at inducing the participation of all key emitters.

Provided that the coalition of the willing is sufficiently large, however, participation enforcement may matter more to the provision of climate change mitigation than compliance enforcement. Unlike compliance enforcement, participation enforcement may be used to induce the participation of countries that would not have consented to the agreement, had they participated in

negotiating it. Thus, even if agreement among all key emitters on enforcement is not politically feasible, an agreement which enforces the cooperation of all key emitters may be politically feasible.

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